

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.

PAT-NO: JP406096425A

DOCUMENT-IDENTIFIER: JP 06096425 A

TITLE: RECORDING AND REPRODUCING COMPOSITE HEAD FOR
VERTICAL
MAGNETIC RECORDING

PUBN-DATE: April 8, 1994

INVENTOR-INFORMATION:

NAME

KOMURO, MATAHIRO

MITSUOKA, KATSUYA

HOSHIYA, HIROYUKI

ASSIGNEE-INFORMATION:

NAME

HITACHI LTD

COUNTRY

N/A

APPL-NO: JP04243010

APPL-DATE: September 11, 1992

INT-CL (IPC): G11B005/39, G11B005/31

ABSTRACT:

PURPOSE: To provide the composite head suitable for a high recording density and to obtain reproduction efficiency of a high density by facilitating the growth of films having smooth surfaces without disturbing the periodic structure of an MR element consisting of multilayered films having a high magnetic resistance change ratio at the time of executing reproducing with a vertical magnetic recording medium.

CONSTITUTION: A main magnetic pole magnetic film 2 is formed on one side of

a substrate and an MR film 3 is formed on the rear side of this main magnetic pole magnetic film 2 via this substrate. The substrate surface is smoothed by making combination use of surface cleaning methods, such as etching by ion beams, polishing and heat-treating. There is a coil 6 formed of annular multiple layers molded by a resin, etc., 5 between the main magnetic pole film 2 and an auxiliary magnetic pole film 4. The MR film is magnetically coupled via the insulating film 7 to the auxiliary magnetic pole film 8 and the main magnetic pole film 2. The insulating film 7 is formed to $\geq 10 \mu\text{m}$ thickness by a method, such as sputtering. The auxiliary magnetic pole film 8 is further protected by an insulating protective film 9 consisting of SiO_2 , Al_2O_3 , etc.

COPYRIGHT: (C)1994,JPO&Japio